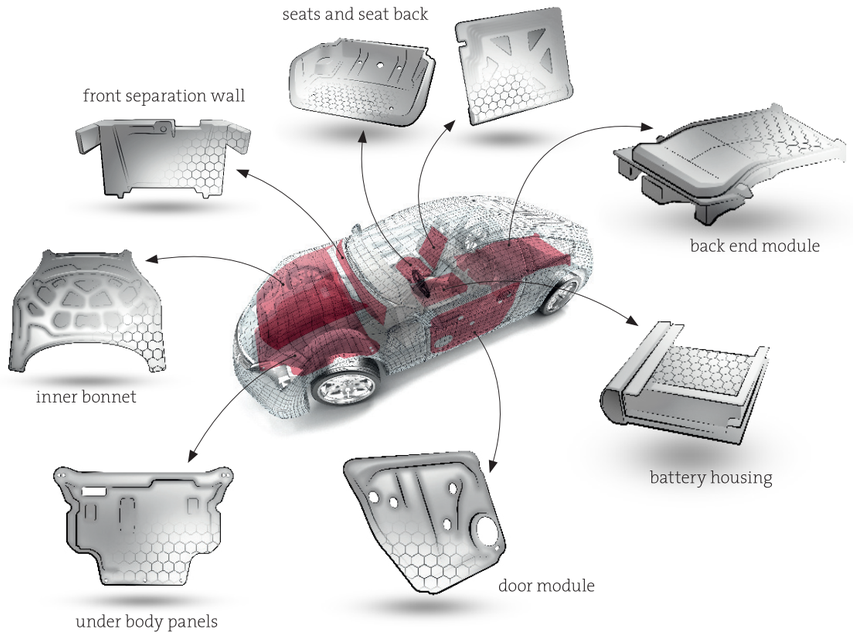

Potential automotive applications

THERMHEX PP SANDWICH PANEL

The ThermHex PP sandwich panel production is based on the patented ThermHex process. The process enables the continuous inline production of thermoplastic honeycomb cores in a fully automatic production line.

By using our lightweight panel weight savings of over 80 % are possible compared to a monolithic construction. In comparison to a monolithic organosheet laminate, a sandwich of the same stiffness requires less number of layers, which means considerable cost savings when using the ThermHex PP sandwich panel.

The panel consists of 0°/90° cross ply laminate skin layers made of continuous glass fiber reinforced polypropylene (GF/PP). The folded honeycomb core material consists of a polypropylene as well. This allows an optimal bonding between core and skin layers in the lamination process by thermoplastic welding. The sandwich can be pressed locally to a monolithic laminate which allows the thermoforming of multi-curved shell structures and the pressing of pressure stable monolithic joining surfaces in one step. The pressed areas offer the possibility of functional integration by means of injection molding. Hence, complex lightweight parts can be produced very cost-efficient in short cycle-times which is essential for many automotive applications.

THERMHEX WABEN GMBH

Merseburger Str. 237
D – 06130 Halle/Saale

Tel.: +49 345 131627 10
Fax: +49 345 131627 19
Email: info@ThermHex.com
Web: www.ThermHex.com

Management System ISO 9001:2015
TÜVRheinland ZERTIFIZIERT
www.tuv.com ID 9108647278

ThermHex
an econcore group company

ThermHex Waben is a licensee of EconCore NV (Belgium), the technology leader for cost-efficient sandwich material production technologies.

THERMHEX PP SANDWICH PANEL

THERMHEX POLYPROPYLENE HONEYCOMB CORE WITH GF/PP SKIN

ThermHex
an econcore group company

PRODUCT DESCRIPTION	6THPP120CP820	12THPP120CP820	15THPP120CP820	20THPP120CP820
Sandwich thickness	6 mm	12 mm	15 mm	20 mm
Skin layer thickness	0,5 mm	0,5 mm	0,5 mm	0,5 mm
Core thickness	5 mm	11 mm	14 mm	19 mm
Cell size	4 mm	5 mm	5 mm	5 mm
Weight per unit area	2.400 - 2.460 g/m²	3.120 - 3.240 g/m²	3590 g/m²	4240 g/m²
Sandwich density	400 - 410 kg/m³	260 - 270 kg/m³	235 - 245 kg/m³	210 - 220 kg/m³
Core density	120 - 130 kg/m³	120 - 130 kg/m³	120 - 130 kg/m³	120 - 130 kg/m³
Bending stiffness (CD, L / MD, W)	140-125 Nm (at 400 mm span length in 3PB test)	590-475 Nm (at 400 mm span length in 3PB test)	900- 600 Nm (at 400 mm span length in 3PB test)	1600- 700 Nm (at 400 mm span length in 3PB test)
Compressive strength (Z-direction) ASTM C365-57	2,0 MPa (290 Psi)	2,0 MPa (290 Psi)	2,0 MPa (290 Psi)	2,4 MPa (290 Psi)
Compressive modulus (Z-direction) ASTM C365-57	60 MPa (5.800 Psi)	140 MPa (5.800 Psi)	140 MPa (5.800 Psi)	140 MPa (5.800 Psi)
Shear strength (CD, L / MD, W) ASTM C273-61	1,2 MPa – 0,5 MPa (101 Psi – 58 Psi)	1,2 MPa – 0,5 MPa (101 Psi – 58 Psi)	1,2 MPa – 0,5 MPa (101 Psi – 58 Psi)	1,2 MPa – 0,5 MPa (101 Psi – 58 Psi)
Shear modulus CD, L / MD, W) ASTM C273-61	50 MPa – 16 MPa (3.045 Psi – 870 Psi)	50 MPa – 16 MPa (3.045 Psi – 870 Psi)	50 MPa – 16 MPa (3.045 Psi – 870 Psi)	50 MPa – 16 MPa (3.045 Psi – 870 Psi)

PRODUCT DESCRIPTION	6THPP80CP580	12THPP80CP580	15THPP80CP580	20THPP80CP580
Sandwich thickness	6 mm	12 mm	15 mm	20 mm
Skin layer thickness	0,4 mm	0,4 mm	0,4 mm	0,4 mm
Core thickness	5,2 mm	11,2 mm	14,2 mm	19,2 mm
Cell size	4 mm	5 mm	5 mm	5 mm
Weight per unit area	1700 g/m²	2240 g/m²	2510 g/m²	2960 g/m²
Sandwich density	280 - 290 kg/m³	180 - 190 kg/m³	165 - 175 kg/m³	145 - 155 kg/m³
Core density	80 - 90 kg/m³	80 - 90 kg/m³	80- 90 kg/m³	80 - 90 kg/m³
Bending stiffness (CD, L / MD, W)	90 - 70 Nm (at 400 mm span length in 3PB test)	420 - 290 Nm (at 400 mm span length in 3PB test)	600- 400 Nm (at 400 mm span length in 3PB test)	1000 - 420 Nm (at 400 mm span length in 3PB test)
Compressive strength (Z-direction) ASTM C365-57	1,2 MPa (290 Psi)	1,2 MPa (290 Psi)	1,0 MPa (290 Psi)	1,2 MPa (290 Psi)
Compressive modulus (Z-direction) ASTM C365-57	25 MPa (5.800 Psi)	40 MPa (5.800 Psi)	40 MPa (5.800 Psi)	40 MPa (5.800 Psi)
Shear strength (CD, L / MD, W) ASTM C273-61	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)
Shear modulus CD, L / MD, W) ASTM C273-61	15 MPa – 6 MPa (3.045 Psi – 870 Psi)	15 MPa – 6 MPa (3.045 Psi – 870 Psi)	15 MPa – 6 MPa (3.045 Psi – 870 Psi)	15 MPa – 6 MPa (3.045 Psi – 870 Psi)

PRODUCT DESCRIPTION	6THPP80GC340	12THPP80GC340	15THPP80GC340	20THPP80GC340
Sandwich thickness	6 mm	12 mm	15 mm	20 mm
Skin layer thickness	0,25 mm	0,25 mm	0,25 mm	0,25 mm
Core thickness	5,5 mm	11,5 mm	14,5 mm	19,5 mm
Cell size	4 mm	5 mm	5 mm	5 mm
Weight per unit area	1220 g/m²	1760 g/m²	2030 g/m²	2480 g/m²
Sandwich density	200 - 210kg/m³	140 - 150 kg/m³	130 - 140 kg/m³	120 - 130 kg/m³
Core density	80 - 90 kg/m³	80 - 90 kg/m³	80 - 90 kg/m³	80 - 90 kg/m³
Bending stiffness (CD, L / MD, W)	28 - 18 Nm (at 400 mm span length in 3PB test)	110 - 80 Nm (at 400 mm span length in 3PB test)	170 - 120 Nm (at 400 mm span length in 3PB test)	320- 220 Nm (at 400 mm span length in 3PB test)
Compressive strength (Z-direction) ASTM C365-57	1,2 MPa (290 Psi)	1,2 MPa (290 Psi)	1,2 MPa (290 Psi)	1,2 MPa (290 Psi)
Compressive modulus (Z-direction) ASTM C365-57	25MPa (5.800 Psi)	40 MPa (5.800 Psi)	40 MPa (5.800 Psi)	40 MPa (5.800 Psi)
Shear strength (CD, L / MD, W) ASTM C273-61	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)	0,5 MPa – 0,3 MPa (101 Psi – 58 Psi)
Shear modulus CD, L / MD, W) ASTM C273-61	15 MPa – 6 MPa (3.045 Psi – 870 Psi)	15 MPa – 6 MPa (3.045 Psi – 870 Psi)	15 MPa – 6 MPa (3.045 Psi – 870 Psi)	15 MPa – 6 MPa (3.045 Psi – 870 Psi)

SHARED DATA FOR ALL CONFIGURATIONS				
Temperature range (°C)	- 30 to + 80; short term up to + 140			
Thermal conductivity W / mk	0,045	0,060	0,065	0,075
Fire-resistance	Normally inflammable, higher grades of fire-resistance can be obtained in sandwich elements when using specialized surface modification.			
Chemical resistance	Excellent resistance to water, most acids, bases and salt solutions.			
Standard dimension	1200 mm x 2500 mm			